


**Notice of Allowability**

<b>Application No.</b>	<b>Applicant(s)</b>	
09/854,918	NOH, HYUNG-GON 	
<b>Examiner</b>	<b>Art Unit</b>	
Susy N Tsang-Foster	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment filed on 12/1/2003.
2. ☒ The allowed claim(s) is/are 1,3-7 and 9-18.
3. ☒ The drawings filed on 15 May 2001 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All    b) ☐ Some\*    c) ☐ None    of the:
  1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached  
1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

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|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)  | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br>Paper No./Mail Date _____ | 7. <input type="checkbox"/> Examiner's Amendment/Comment                               |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material          | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance   |
|   | 9. <input type="checkbox"/> Other _____.   |

*Allowable Subject Matter*

1. Claims 1, 3-7, and 9-18 are allowed.
2. The following is an examiner's statement of reasons for allowance:

The closest prior art of record, Andrieu (US 5,290,644) discloses a lithium battery comprising a spiral electrode assembly and a polypropylene separator between the anode and the cathode (col. 1, lines 46-624 col. 3, lines 1-25). Andrieu also discloses a film of a cross-linked polymer that is in contact with the polypropylene separator and the positive electrode (col. 3, lines 20-35). The spiral electrode assembly is soaked in a solution of propylene carbonate and dimethoxythane containing 1 M lithium perchlorate in order to swell the cross-linked polymer (col. 3, lines 20-35). The cross-linked polymer is obtained by crosslinking an amine containing polyethylene glycol with a polyepoxy resin (col. 2, lines 61-67).

However, Andrieu does not disclose, teach, or suggest a lithium battery comprising an electrolyte gel solution that is obtained by mixing a first solution of a prepolymer for forming an epoxy resin and an amine with a second solution of a lithium salt and an organic solvent and injecting the resultant mixture into a battery case having an electrode assembly therein to form a solution filled case and thermally polymerizing the solution filled case to form the electrolyte gel solution as recited in instant claims 12, 13, 17, and 18. The internal battery structure of the claimed invention as a result of polymerizing the electrolyte gel solution in the battery case containing a solution of a prepolymer for forming an epoxy resin and an amine differs from that of Andrieu where the gel electrolyte is situated between the polypropylene separator and the positive electrode.

The closest prior art of record, Peng et al., ("Ionic conductivity of epoxy network/polyethylene-glycol-lithium perchlorate complex IPN system", Chinese Journal of Polymer Science (1990), 8(4), pp. 342-6) disclose a polymeric solid electrolyte composed of bisphenol A epoxy resin/polyethylene glycol containing  $\text{LiClO}_4$  crosslinked by tetraethylene pentamine (TEPA) but the reference does not disclose, teach or suggest that the epoxy resin in the polymer electrolyte is formed from a prepolymer given by formula 1 recited in instant claims 1, 3-7, 9-11, and 14-16.

Peng et al. also do not disclose, teach, or suggest a lithium battery comprising an electrolyte gel solution that is obtained by mixing a first solution of a prepolymer for forming an epoxy resin and an amine with a second solution of a lithium salt and an organic solvent and injecting the resultant mixture into a battery case having an electrode assembly therein to form a solution filled case and thermally polymerizing the solution filled case to form the electrolyte gel solution as recited in instant claims 12, 13, 17, and 18.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

3. Any inquiry concerning this communication or earlier communications should be directed to examiner Susy Tsang-Foster, Ph.D. whose telephone number is (571) 272-1293. The examiner can normally be reached on Monday through Friday from 9:30 AM to 6:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached at (571) 272-1292.

The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

st/ *Susy Tsang-Foster*

Susy Tsang-Foster  
Primary Examiner  
Art Unit 1745